

1. Product and company identification

Product name	: Citric Acid Anhydrous, Powder
Synonym	: citric acid anhydrous; 1,2,3-Propanetricarboxylic acid, 2-hydroxy-; Citric acid, >50% in a non hazardous diluent; Citric acid, >1 - 3% in a non hazardous diluent; Citric acid, >10 - 50% in a non hazardous diluent; Citric acid, >3 - 10% in a non hazardous diluent; 2-Hydroxy-1,2,3-propanetricarboxylic acid; 2-Hydroxypropane-1,2,3-tricarboxylic acid
Material uses	: Other non-specified industry: Food additive. Manufacture of pharmaceutical products.
CAS number	: 77-92-9
Code	: 432717
Supplier	: S.A. Citrique Belge N.V. Pastorijstraat 249 3300 TIENEN Belgium
Validation date	: 25/07/2011.
Prepared by	: Atrion Regulatory Services, Inc.
In case of emergency	: +32-16-806408

2. Hazards identification

Physical state	: Solid. [Crystalline Granulate Powder.]
Color	: Colorless./White.
Odor	: Odorless.
Emergency overview	
Signal word	: WARNING!
Hazard statements	: CAUSES EYE IRRITATION. MAY CAUSE SKIN IRRITATION.
Precautions	: Keep away from heat, sparks and flame. Prevent dust accumulation. Do not get in eyes. Avoid breathing dust. Avoid contact with skin and clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame).
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Routes of entry	: Dermal contact. Eye contact.
Potential acute health effects	
Inhalation	: Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
Ingestion	: No known significant effects or critical hazards.
Skin	: Moderately irritating to the skin.
Eyes	: Severely irritating to eyes. Risk of serious damage to eyes.
Potential chronic health effects	
Chronic effects	: Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.
Carcinogenicity	: No known significant effects or critical hazards.No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC or OSHA or NTP or ACGIH
Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.

2. Hazards identification

Fertility effects : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:
irritation
redness

Eyes : Adverse symptoms may include the following:
pain or irritation
watering
redness

Medical conditions aggravated by over-exposure : None known.

3. Composition/information on ingredients

Name	CAS number	%
CITRIC ACID	77-92-9	60-100

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Do not give milk or alcoholic beverages.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : Fine dust clouds may form explosive mixtures with air.

Extinguishing media

Suitable : Water or Foam.

Not suitable : Do not use water jet.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product.

Special remarks on explosion hazards : Collect contaminated fire-fighting water separately. It must not enter the sewage system. Contain and dispose of waste according to local regulations.

6. Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

Small spill : Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Avoid creating dusty conditions and prevent wind dispersal. Vacuum or sweep up material and place in a designated, labeled waste container.

Large spill : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal. Avoid creating dusty conditions and prevent wind dispersal. Vacuum or sweep up material and place in a designated, labeled waste container.

7. Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing dust. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Electrical equipment and lighting should be protected to appropriate standards to

7. Handling and storage

prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Empty containers retain product residue and can be hazardous. Do not reuse container.

- Storage** : Store between the following temperatures: 10 to 30°C (50 to 86°F). Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Do not reuse container.

8. Exposure controls/personal protection

United States

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

- Engineering measures** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. >8 hours (breakthrough time): nitrile rubber

- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If operating conditions cause high dust concentrations to be produced, use dust goggles. Recommended: safety glasses with side-shields

- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state	: Solid. [Crystalline Granulate Powder.]
Flash point	: Closed cup: 345°C (653°F)
Color	: Colorless./White.
Odor	: Odorless.
pH	: 2.2 at g/l: 10 1.7 at g/l: 100 1.8 at g/l: 50
Boiling/condensation point	: >175°C (>347°F)
Melting/freezing point	: 153°C (307.4°F)
Relative density	: 1.665 at 20°C
Density	: 1.665 g/cm ³ [18°C (64.4°F)]
VOC content	: 14 lbs/gal (1678.3 g/l)
Viscosity	: Dynamic: 6.5 mPa·s (6.5 cP)
Solubility	: Soluble in the following materials: Ethanol Partially soluble in the following materials: diethyl ether Insoluble: Benzene, Chloroform. Water: 576 -1330 g/l at 20°C
LogK_{ow}	: -1.72
Physical/chemical properties comments	: Molecular weight:192.12g/mole

10. Stability and reactivity

Chemical stability	: The product is stable. Decomposes on heating.
Conditions to avoid	: Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Prevent dust accumulation. heat
Incompatible materials	: Reactive or incompatible with the following materials: reducing materials, acids and alkalis. Reactive or incompatible with the following materials: oxidizing materials
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerization will not occur.

11. Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
CITRIC ACID	LD50 Oral	Mouse	5400 mg/kg	-
	LD50 Oral	Rat	3000 mg/kg	-
	LD50 Subcutaneous	Mouse	2700 mg/kg	-
	LD50 Subcutaneous	Rat	5500 mg/kg	-
	LDLo Oral	Rabbit	7000 mg/kg	-

Conclusion/Summary : Not classified as dangerous

Chronic toxicity

11. Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
CITRIC ACID	Chronic NOAEL Oral	Rat	1200 mg/kg	2 years
	Chronic NOAEL Oral	Rat	4000 mg/kg	5 days
	Chronic NOAEL Oral	Rat	2000 mg/kg	90 days

Conclusion/Summary : Not classified as dangerous

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
CITRIC ACID	Skin - Moderate irritant	Rabbit	-	0.5 Milliliters	-
	Eyes - Severe irritant	Rabbit	-	72 hours 750 Micrograms	-
	Skin - Mild irritant	Rabbit	-	72 hours 500 milligrams	-

Conclusion/Summary : Not available.

Skin : Causes mild skin irritation.

Eyes : Causes eye irritation.

Respiratory : May cause respiratory irritation.

Sensitizer

Product/ingredient name	Route of exposure	Species	Result
CITRIC ACID	skin	Guinea pig	Not sensitizing

Conclusion/Summary : Not available.

Skin : Non-sensitizer to skin.

Respiratory : No known significant effects or critical hazards.

Carcinogenicity

Conclusion/Summary : Not classified as dangerous
Rat Oral: No carcinogenic effect.

Classification

Not available.

Mutagenicity

Product/ingredient name	Test	Experiment	Result
CITRIC ACID	-	Experiment: In vivo Subject: Mammalian-Animal	Negative

Conclusion/Summary : Not mutagenic in Ames test.

Teratogenicity

Not available.

Conclusion/Summary : No teratogenic effect.
NOAEL (Rat Female) > 241 mg/kg

Reproductive toxicity

Not available.

Conclusion/Summary : No known significant effects or critical hazards.
NOAEL (Female Rat) = 600 mg/kg
NOAEL (Rat) = 2500 mg/kg

12. Ecological information

Ecotoxicity : Readily biodegradable This product shows a low bioaccumulation potential.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
CITRIC ACID	Acute EC50 120 mg/l	Daphnia	72 hours
	Acute EC50 >10000 mg/l	Micro-organism - Pseudomonas putida	16 hours
	Acute LC50 440 to 760 mg/l	Fish - Leuciscus idus	96 hours

Conclusion/Summary : Not classified as dangerous

Persistence/degradability

Product/ingredient name	Test	Result	Dose	Inoculum
CITRIC ACID	-	98 % - Readily - 2 days	600 mg/l	-
	-	98 % - Inherent - 7 days	800 mg/l	-

Conclusion/Summary : Readily biodegradable

Partition coefficient: n-octanol/water : -1.72

Bioconcentration factor : 0.01

13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

DOT/IMDG/IATA : Not regulated.

15. Regulatory information

HCS Classification : Irritating material

U.S. Federal regulations : TSCA 8(a) IUR: Partial exemption

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: CITRIC ACID

SARA 311/312 MSDS distribution - chemical inventory - hazard identification:

CITRIC ACID: Immediate (acute) health hazard

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

15. Regulatory information

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 313

Form R - Reporting requirements : Not applicable.

Supplier notification : Not applicable.

State regulations

Massachusetts : None of the components are listed.

New York : None of the components are listed.

New Jersey : The following components are listed: CITRIC ACID

Pennsylvania : The following components are listed: CITRIC ACID

California Prop. 65

Not available.

United States inventory (TSCA 8b) : All components are listed or exempted.

Canada inventory : All components are listed or exempted.

International regulations

International lists :

- Australia inventory (AICS)**: All components are listed or exempted.
- China inventory (IECSC)**: All components are listed or exempted.
- Japan inventory**: All components are listed or exempted.
- Korea inventory**: All components are listed or exempted.
- New Zealand Inventory of Chemicals (NZIoC)**: All components are listed or exempted.
- Philippines inventory (PICCS)**: All components are listed or exempted.

Chemical Weapons Convention List Schedule I Chemicals : Not listed

Chemical Weapons Convention List Schedule II Chemicals : Not listed

Chemical Weapons Convention List Schedule III Chemicals : Not listed

16. Other information

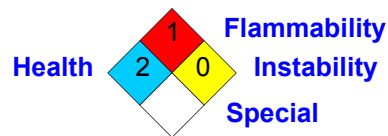
Label requirements : CAUSES EYE IRRITATION. MAY CAUSE SKIN IRRITATION.
Hazardous Material Information System (U.S.A.) :

Health	1
Flammability	1
Physical hazards	0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :



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Version : 4

Indicates information that has changed from previously issued version.

Notice to reader

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Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.